

Application No. 10/551,872  
Declaration Under 37 C.F.R. § 1.132  
Docket No.: 357356US99PCT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF:

GROUP: 1796

Akihiro OHASHI, et al.

SERIAL NO: 10/551,872

EXAMINER: Boyle, Robert C.

FILED: September 30, 2005

FOR: INJECTION-MOLDED OBJECT

**DECLARATION UNDER 37 C.F.R. § 1.132**

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

Sir:

Now comes Kazuya Tanaka who deposes and states that:

1. I am a graduate of Nagoya University and received my master's degree in Molecular Design and Engineering in the year 2001.
2. I have been employed by Mitsubishi Plastics, Inc. for 9 years as a researcher in the field of plastic processing.
3. Attached Exhibit 1 is a HIGILITE Catalog and an English language translation of portions thereof. Exhibit 1 also includes an enlarged copy the Catalog's back cover, clearly showing the Catalog publication date to be May 20, 1992. Because priority has been perfected by filing a certified English language translation of parent Japanese Application No. 2003-098736, the earliest priority date of the present application is April 2, 2003. The Catalog publication date predates the present application's earliest priority date.

Exhibit 2 is a similar Table to the Table found at page 8 of the Catalog. The similar Table in Exhibit 2 is an English language version of relevant parts of a table that appears in the Product Information page for HIGILITE™ (the source for Exhibit 2 is the SHOWA DENKO website at [http://www.products-e.sdk.co.jp/50on\\_e.html](http://www.products-e.sdk.co.jp/50on_e.html)).

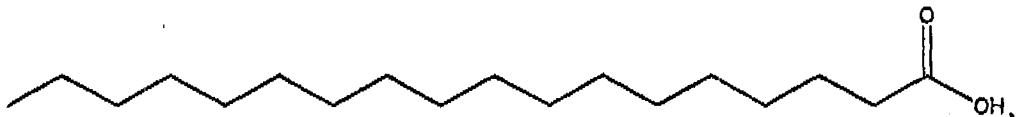
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As described in the translated Catalog at page 2, "HIGILITE is aluminum hydroxide produced from bauxite through the Bayer process, and the chemical formula is  $\text{Al}(\text{OH})_3$  or  $\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ ." "B103" also is produced from bauxite through the Bayer process. Specification Comparative Example 4, page 44, describes that "B103," a "non surface-treated aluminum hydroxide" has a w- $\text{Na}_2\text{O}$  content of "0.2 %" by weight. B103 is commercial aluminum hydroxide product that was available at the present application's earliest priority date.

Based on Exhibits 1-2, and B103, the Office is requested to take judicial notice that unsurface treated aluminum oxide (e.g., a starting material that can be subsequently surface treated), prepared from bauxite by the Bayer process, was known and enabled at the present application's earliest priority date.

Translated Catalog pages 4 to 5 describes, in part: "The product [aluminum hydroxide] is subjected to coating processing by using silane-based or titanate-based coupling agent or to being treated by stearic acid (fatty acid) on the surface." Here, stearic acid has the following structure:



so stearic acid is a long chain (e.g., higher) fatty acid. The Table found at page 8 of the Catalog in Exhibit 1 describes that the amount of w- $\text{Na}_2\text{O}$  present on the HIGILITE aluminum hydroxide after various treatments or improvements. For example, products H-32ST, H-42STV, and H-42T, were each treated with a coupling agent, as described above, and contained respectively, a w- $\text{Na}_2\text{O}$  content of 0.03, 0.06, and 0.06, all in % by weight. Further, the Catalog, via Exhibit 1, describes that treatment of the aluminum hydroxide with stearic acid results in samples H-42S and H-43S that contained, respectively, w- $\text{Na}_2\text{O}$  in amounts of 0.08 and 0.13 % by weight. Thus, aluminum hydroxides containing w- $\text{Na}_2\text{O}$  within the claimed weight range of from a positive amount (e.g., more than 0%) to 0.1 mass % by weight or less can be commercially available, at the present application's earliest priority date. Also,

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aluminum hydroxides containing w-Na<sub>2</sub>O outside of the claimed weight range can be commercially available, for example, "H-43S" being employed in Comparative Example 5 of this invention. The claims are enabled on this basis alone.

The Office, at Official Action page 2, asserts that because "the exhibits are directed to a product with the tradename 'HIGILITE' and that specific trade name does not appear in the specification, it is requested that the nexus requirement...showing the connection between HIGILITE and the instant invention be explained."

The nexus between the present application specification and the above-presented Catalog results is as follows:

Specification page 8 describes in part, that "The surface-treating methods for the metal hydroxide [which necessarily includes aluminum hydroxide] include methods of coating the metal hydroxide with a higher fatty acid, a silane coupling agent, a titanate coupling agent...and so on. The metal hydroxide...is preferably surface-treated by one or more of these surface-treating methods." Specification page 8 further describes that "the amount of w-Na<sub>2</sub>O can be decreased by performing such a surface treatment to the metal hydroxide..." As described above, aluminum hydroxide starting materials were known, and commercially available, at the present application's earliest priority date.

Thus, the specification describes surface-treating methods carried out on known starting materials which are commercially available as described above, and for example, aluminum hydroxides containing w-Na<sub>2</sub>O within the claimed weight range of from a positive amount (e.g., more than 0%) to 0.1 mass % by weight or less are produced by performing such a surface treatment.

Additionally and separately, specification page 32, lines 2-5, describe "BW103ST" is an "aluminum hydroxide surface treated with a silane coupling agent" and having a "w-Na<sub>2</sub>O" content = "0.05" % by weight. BW103ST, as demonstrated by its being employed in Example 2, was commercially available at the present application's earliest priority date, and is a

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representative species falling within the claimed genus of aluminum hydroxides containing w-  
Na<sub>2</sub>O within the claimed weight range.

4. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

5. Further deponent saith not.

Kazuya Tanaka

Signature

September 21, 2010

Date

Customer Number

**22850**

Tel. (703) 413-3000  
Fax. (703) 413-2220  
(OSMMN 09/06)

# **EXHIBIT 1**

2009年4月8日 12時00分



SHOWA  
DENKO

# アルミナ ハイジライト

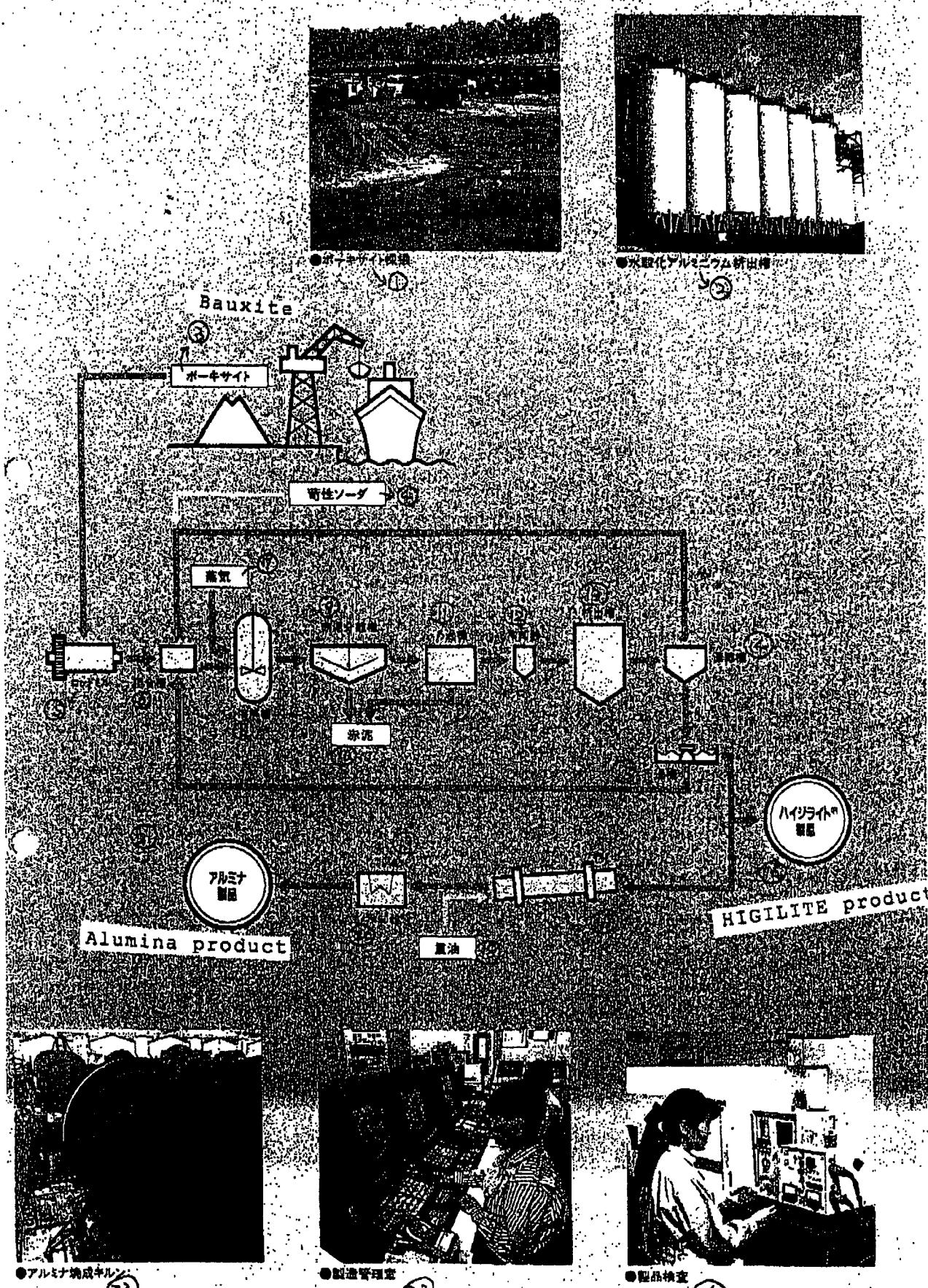


PRODUCT GUIDE

2009年 4月 8日 12時01分

進歩技術事務所

NO. 2628 P. 5/14



● アルミナ焼成キルn

● 製造管理室

● 製品検査

(22)

(23)

(24)

# ハイジライト

(水酸化アルミニウム)

HIGILITE<sup>R</sup>  
→ (Aluminum hydroxide)

ハイジライトはホーキサイトを原料とし、バイヤー法により製造された水酸化アルミニウムで、化学式  $\text{Al}_2(\text{OH})_5 \cdot 3\text{H}_2\text{O}$  で表されます。

ハイジライトはGibbsiteまたはHydrargilliteと呼ばれる白色粉末結晶で、約200°Cまで安定ですが、それ以上の温度では結晶水の脱離が心配となり、大きな吸熱を示します。また、助酸、助塩基との反応によりアルミニウム酸、アルミニウム酸塩となります。

別表に示されるように幅広い用途を持ち、その用途に従って、粗粒・標準粒・細粒・微粒のハイジライトを用意しております。

また、当社ではハイジライトの特殊加工品、高白色品を生産し、先端市場のニーズに応えるべく努力しております。

## Characteristics of HIGILITE

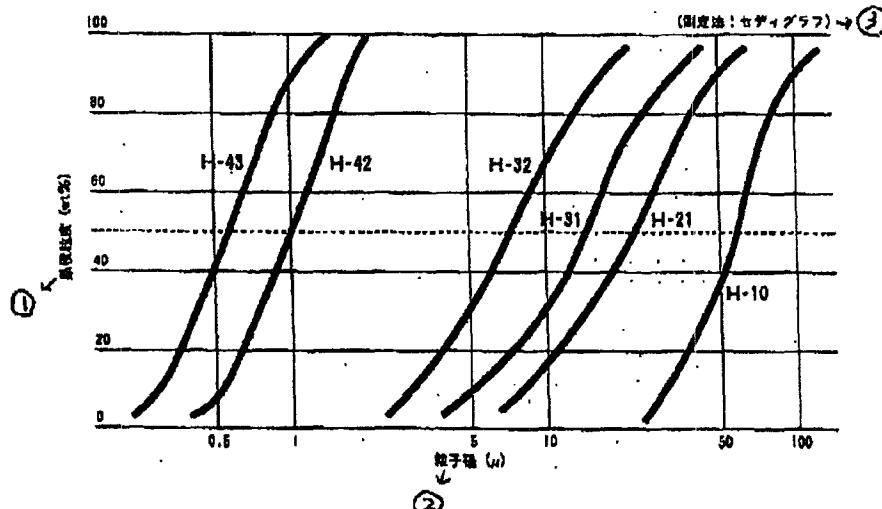
### ハイジライトの特性

①	ギブサイト → ⑦
②	単斜晶系 $a: 8.82, b: 5.05, c: 9.70 \text{ \AA}$
③	(001) 完全
④	2.42 ⑪
⑤	9
⑥	1.57
⑦	0.29 cal/g·°C(25°C)
⑧	(110)10.9, (001)18.4, (100)13.1, (101)9.9, (101)-5.6

既存化学物質番号 1-11

## Particle size distribution of HIGILITE

### ハイジライトの粒度分布



# 特殊加工ハイジライト®

↓ Specially processed HIGILITE®

ハイジライトの優れた特性である耐熱性や低発煙性をより広い用途にご利用いただくため、ゴム・プラスチックとの相容性を向上させた製品など、特殊加工品を各種用意しております。

## 1. カップリング剤処理品

シリコン系やチタノート系カップリング剤でコーティング処理したもので、樹脂との相容性を向上させたものです。

## 2. 低粘度品

液状プラスチックに充填する場合の粘度上昇を小さくするように改良したものです。

## 3. 低導電率品

電気絶縁用途用に耐熱性や絶縁抵抗を改良したもので、耐熱性を要求される用途にも適します。

## 4. ステアリン酸処理品

ステアリン酸にて表面処理したもので、ゴムやプラスチックへの分散性を改良したものです。

## → ■ Applications

### ■ 用途

- (1) カップリング剤処理品：BMC、SMC、人造大理石、エポキシ成形品、ポリオレフィン成形
- (2) 低粘度品：BMC、SMC、スプレー・ハンドレーラップ成形によるFRP各種製品、建材
- (3) 低導電率品：エポキシ、ポリウレタン樹脂注型品、プリント配線基板その他各種電子・電気部品
- (4) ステアリン酸処理品：ゴム、塩化ビニール樹脂、ポリオレフィン各種製品

表記以外の製品のご用命も受けたまわっております。

お気軽にお相談下さい。

## → ■ Representative characteristic value for quality

### ■ 品質代表特性値

	②	③	④	⑤	⑥				
①	0.19	0.23	0.27	0.19	0.13	0.10	0.18	0.22	0.40
②	99.6	99.6	99.6	99.8	99.8	99.8	99.7	99.8	99.6
③	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
④	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
⑤	0.21	0.32	0.28	0.21	0.21	0.13	0.27	0.38	0.40
⑥	0.03	0.06	0.06	0.04	0.04	0.002	0.005	0.08	0.13
⑦	3.5	1.0	1.0	3.5	3.5	8	1.0	1.0	0.6
⑧	—	—	—	—	—	—	—	—	—
⑨	0.09	0.02	0.01	0.05	0.05	0.07	0.02	0.02	0.04
⑩	0.6	0.3	0.4	0.5	0.7	0.7	0.2	0.4	0.3
⑪	1.1	0.6	0.7	1.0	1.1	1.1	0.5	0.7	0.6
⑫	91	94	94	92	90	94	98	94	98
⑬	17	38	36	28	16	32	48	36	40
⑭	—	—	—	9.3	—	7.6	7.7	—	—
⑮	3.0	6.0	5.0	3.5	2.6	2.0	5.4	5.0	7.5
⑯	0.80	0.30	0.32	0.60	0.26	0.15	0.30	0.30	0.60
⑰	150	—	—	150	—	15	30	—	—

\* 相対湿度70%、温度25°C

*translation*

(p3)

- ① Bauxite mining
- ② Aluminum hydroxide precipitation tank
- ③ Bauxite
- ④ Caustic soda
- ⑤ Rod mill
- ⑥ Mixing tank
- ⑦ Steam
- ⑧ Dissolving tank
- ⑨ Red mud separation tank
- ⑩ Red mud
- ⑪ Filter
- ⑫ Cooler
- ⑬ Precipitation tank
- ⑭ Concentration tank
- ⑮ Filter
- ⑯ HIGILITE product
- ⑰ Rotary kiln
- ⑱ Heavy oil
- ⑲ Water
- ⑳ Cooler
- ㉑ Alumina product
- ㉒ Alumina calcinating kiln
- ㉓ Production control room
- ㉔ Product inspection

(p4)

### HIGILITE®

#### (Aluminum hydroxide)

HIGILITE is aluminum hydroxide produced from bauxite through the Bayer Process, and the chemical formula is  $\text{Al}(\text{OH})_3$ , or  $\text{Al}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$ .

HIGILITE is a white powder crystal called Gibbsite or Hydrargillite, which is stable up to about 200°C. At 200°C or higher, however, dissociation reactions of the crystallization water begin, which shows a large endotherm. In addition, HIGILITE reacts with strong acid and strong base to yield an aluminum salt or an aluminate.

HIGILITE is used for various purposes, as shown in attached table, and is provided in the form of coarse particles, standard particles, fine particles, and very fine particles, depending on the intended use.

We are making efforts to meet the need of advanced markets by offering specially processed and highly white HIGILITE.

**■ Characteristics of HIGILITE**

- ① Mineral name
- ② Crystal system
- ③ Cleavage property
- ④ Absolute specific gravity
- ⑤ Hardness (Mohs hardness)
- ⑥ Refractive index
- ⑦ Specific heat
- ⑧ Thermal expansion coefficient
- ⑨ Gibbsite
- ⑩ Monoclinic system
- ⑪ Complete
- ⑫ Existing chemicals No.

**■ Particle size distribution of HIGILITE**

- ① Cumulative percentage of particle size
- ② Particle size
- ③ Measurement method: Sedi Graph

(p8)

**Specially processed HIGILITE®**

In order that excellent properties of fire retardancy and low smoke evolution of HIGILITE may be utilized for wide range of application, varieties of specially processed products such as a product with improved compatibility with rubber and plastics are provided.

**1. Product treated by coupling agent**

The product is subjected to coating processing by using silane-based or titanate-based coupling agent. The product has improved compatibility with resins.

**2. Product of low viscosity**

The product is improved so that the increase in the viscosity when incorporating HIGILITE into liquid plastic becomes smaller.

**3. Product of low electrical conductivity**

The product has improved humidity resistance and insulation resistance, for electrical insulation purpose. The product is also suitable for the

application requiring heat resistance.

#### 4. Product treated by stearic acid

The product is treated by stearic acid on the surface. The product has improved dispersibility in rubber and plastics.

#### ■ Applications

(1) Product treated by coupling agent: BMC, SMC, artificial marble, epoxy-molded articles, and polyolefin electric cables.

(2) Product of low viscosity: BMC, SMC, various FRP products prepared by spray hand layup forming, and building materials.

(3) Product of low electrical conductivity: epoxy resin or polyurethane resin molded articles, printed circuit boards, and varieties of electronic and electric parts.

(4) Product treated by stearic acid: rubbers, polyvinyl chloride resins, various products of polyolefin resins.

#### ■ Representative characteristic value for quality

- ① Quality item
- ② Product name

- ③ Product treated by coupling agent
- ④ Product of low viscosity
- ⑤ Product of low electrical conductivity
- ⑥ Product treated by stearic acid
- ⑦ Chemical composition
- ⑧ Attached water
- ⑨ Average particle diameter
- ⑩ Bulk density
- ⑪ Light pack
- ⑫ Heavy pack
- ⑬ Whiteness
- ⑭ Oil absorption
- ⑮ Linseed oil
- ⑯ Slurry
- ⑰ BET specific surface area
- ⑱ Percentage of equilibrium moisture absorption
- ⑲ Slurry electrical conductivity
- ⑳ Relative humidity 70%, temperature 25°C

2009年4月8日 12時06分 遠藤国际特许事務所

NO. 2628 P. 14/14

SHOWA DENKO K.K.

昭和電工株式会社

セラミックス事業部

本社 〒106 東京都港区芝大門1-13-8 TEL.03(5470)3588  
名古屋支店 〒460 名古屋市中村区名駅4-7-23(豊田ビル新館) TEL.052(688)0351  
大阪支店 〒541 大阪市中央区今橋4-2-1(大阪富士ビル) TEL.06(229)8678  
福岡支店 〒810 福岡市中央区天神2-8-49(福岡富士ビル) TEL.092(712)4115

受取印

2010年3月12日 18時43分

FP 349 US 遊び事務所

NO. 2104 P. 2

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## 昭和電工株式会社

### セラミックス事業部

本 社 〒105 東京都港区芝大門1-13-9 TEL.03(5470)3586  
名古屋支店 〒450 名古屋市中村区名駅4-7-23(豊田ビル新館) TEL.052(583)0351  
大阪 支 店 〒541 大阪市中央区今橋4-2-1(大阪富士ビル) TEL.06(229)6576  
福 岡 支 店 〒810 福岡市中央区天神2-8-49(福岡富士ビル) TEL.092(712)4115

営業用印

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TP 2010年3月12日 18時43分

選舉事務所

NO. 2104 P. 3

(enlargement copy)

中田 伸一郎

TEL.03(5470)3586

3(豊田ビル新館) TEL.052(583)0351

阪富士ビル) TEL.06(229)6576

福岡富士ビル) TEL.092(712)4115

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# **EXHIBIT 2**

# **EXHIBIT 2**

**■ Typical properties**

Properties	Grades	Coupling-agent-treated				Low-viscosity		Low-conductivity		Stearic-acid-treated	
		H-42ST	H-42STV	H-42STE	H-42T	H-34	H-34HL	H-32I	H-42I	H-42S	H-43S
Chemical composition	Moisture (%)	0.15	0.14	0.14	0.20	0.20	0.17	0.09	0.15	0.20	0.35
	Al(OH) <sub>3</sub> (%)	99.80	99.60	99.60	99.60	99.80	99.80	99.80	99.70	99.60	99.60
	Fe <sub>2</sub> O <sub>3</sub> (%)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	SiO <sub>2</sub> (%)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	Na <sub>2</sub> O (%)	0.18	0.35	0.35	0.33	0.22	0.22	0.15	0.29	0.33	0.40
	w-Na <sub>2</sub> O (%)	0.03	0.05	0.05	0.06	0.04	0.03	0.003	0.008	0.05	0.13
45 μm (%)		0.06	0.02	0.02	0.01	0.05	0.05	0.03	0.01	0.01	0.04
Median particle size (μm)		4.0	1.1	1.1	1.1	4.0	4.0	6.0	1.1	1.1	0.76
Bulk density (g/cm <sup>3</sup> )	Labeled	0.6	0.3	0.3	0.4	0.5	0.7	0.7	0.2	0.4	0.3
	Tapped	1.1	0.6	0.6	0.7	1	1.1	1.1	0.5	0.7	0.6
Whiteness		91	94	94	94	92	90	94	96	98	96
BET specific surface area (m <sup>2</sup> /g)		3.0	5.0	5.0	5.0	3.5	2.5	2.0	5.4	5.0	7.5

←w-Na<sub>2</sub>O

(References)